



## Dumbbell

The invention refers to a dumbbell as claimed in the preamble to claim 1, 2, 3, 4 or 5.

Dumbbells are known in the art in a wide variety of designs and generally allow the exchange of weights or weight disks in order to vary or adapt the total or training weight of the dumbbell to individual preferences or requirements.

The object of the invention is to present a dumbbell that has an attractive outward appearance while enabling fast and easy changing of the weight disks. To achieve this goal, a dumbbell according to patent claim 1, 2, 3, 4 or 5 is embodied. Further embodiments of the invention are described in the dependent claims.

The invention is described below in more detail based on the drawings and a sample embodiment:

Fig. 1 – a simplified representation in partial view of a dumbbell according to the invention;

Fig. 2 – an enlarged individual representation of one end of the dumbbell in Fig. 1, together with several weights or weight disks arranged there;

Fig. 3 – a simplified representation in front view of the dumbbell of Fig. 2;

Fig. 4 – a representation similar to Fig. 2 of a further possible embodiment of the invention;

Fig. 5 – a representation similar to Fig. 3 with a further possible embodiment of the dumbbell according to the invention.

The dumbbell generally designated 1 in Figures 1 – 3 consists essentially of a central, rod-shaped dumbbell element or handle element 2, which merges into a cap-shaped or bell-shaped casings 3 and 4 at both ends.

For reinforcement of the dumbbell 1 there is a metal rod 5 in the hollow tube-shaped handle element 2, which extends into the respective casing 3 or 4 at both ends and is connected there with a cylindrical disk-shaped plate 7 forming the bottom of the interior space 6 of the respective casing 3 or 4. The plate is made of metal, as is the rod 5. The longitudinal axis of the rod 5 defines the longitudinal axis L of the dumbbell 1. The two plates 7 are located on the same axis as this longitudinal axis.

The casings 3 and 4 are identical in the depicted embodiment and are rotationally symmetrical to the longitudinal axis L and are open on both front sides facing away from the handle element 2, namely for inserting/removing disk-shaped weights or weight disks 8 into/from the respective casing 3 or 4.

By using a different number of weights 8 the total weight of the dumbbell 1 can be varied at each end of the dumbbell. In the depicted embodiment the casings 3 and 4 are designed so that there is room for a maximum of five weights 8 in each casing. Other embodiments are also conceivable.

The weights 8 are inserted and removed via the open front side of the casing 3 or 4. The weights 8 are fixed in the interior 6 of the respective casing on the outside circumference of the circular disk-shaped weight disks 8, which then are on the same axis or parallel to the longitudinal axis L, whereby the first weight disk 8 inserted in to the respective interior 6 lies flat against the bottom of the plate 7 forming this space.

At least one casing 3 or 4, but preferably both casings, accommodates electronic circuitry 9 with a corresponding power supply (battery). Of this electronic circuitry 9, Figure 1 also depicts the display field 9.1 and a button or sensor 11 that can be actuated for example by the thumb 10 of the user, which (button or sensor) in this embodiment is located on the edge of the open side of the respective casing 3 or 4. Pressing the button 11 causes, for example, the total weight of the weight disks 8 accommodated in the respective interior space 6 to be displayed on the display 9.1. For this purpose, the electronic circuitry has several contacts 12, one of which is reserved for each weight disk 8, so that the electronic circuitry then displays the total weight corresponding to the number of weight disks accommodated in the interior space 6. Generally it is also possible to use the electronic circuitry for further measurements, for example for a pulse measurement by means of a sensor, etc. corresponding to the button 11 on the respective casing 3 or 4.

As described, the rod 5 and the plates 7 are made of metal, for example of steel. The two casings 3 and 4 and the dumbbell element 2 surrounding the rod 5 are made of one piece from a suitable, impact-resistant and stable plastic material.

As described above, the weight disks 8 are fixed in the respective interior space on their outer circumference. For this purpose, there is a cam 14 that can swivel on bearings in the outer wall 13 of each casing surrounding the interior space 6, namely by means of a cam axis 15 on a swivel axis SW, which is oriented parallel to the longitudinal axis L, but which is radially offset from this longitudinal axis. The cam 14, which extends in the manner of a roller over the entire or nearly the entire axial depth of the respective interior 6, is open on the inner surface of the outer wall. The cam 14 in the depicted embodiment is made of one piece with an actuating lever 16 extending radially from the cam and with which the cam 14 can be swiveled on its cam axis 15, namely between a position in which the actuating lever 16 is completely contained within a peripheral groove 17 of the respective casing, which is the position that locks the disk weight 8 in the respective casing, and a position in which the lever 16 extends beyond the periphery of the casing 3 or 4 and in which the weight disks 8 are released.

Across from the cam 14 molded into the inner surface of the outer wall 16 there are several groove-like recesses 18 that are partially ring-shaped, extending concentric to the longitudinal axis L, such that these recesses 18 are offset from each other in the direction of the longitudinal axis L and extend on the longitudinal axis L over an angle area greater than 90°.

Each recess 18 serves to hold an edge area of a weight disk 8. With cams 14 located in the non-locking position, the desired number of weight disks 8 can thus be inserted into the interior 6 of the respective casing 3 or 4, namely such that these disks lie flat against each other and the first disk lies flat against the plate 7. Afterwards, the cam 14 is swiveled into the locking position by means of the lever 16, which then fixes the individual weight disks 8 in the corresponding groove-shaped recesses 18 and therefore holds them in the respective casing 3 or 4. The recesses 18 extend across a sufficiently large angle area for locking of the weight disks 8 in the respective casing, so that these disks are pressed with their edge area located across from the respective recess 18 by the cam 14 into the corresponding recess 18. For improved locking, the cam 14 can likewise be provided with the recesses 19 corresponding to the recesses 18 or can be rubber-elastic at least on their outside circumference, so that the weight disks 8 press into the cam 14 when it is locked and therefore achieve additional anchoring 8 on the cam 14.

A special feature of the dumbbell 1 is that it is not necessary to line up the weight disks 8 on a stud or bolt. The advantage of the dumbbell 1 consists for example in the fact that this dumbbell can be manufactured with an attractive appearance, that the weight disks 8 are protected in the respective casing 3 or 4 and that the disks can be changed easily and quickly.

Figure 4 shows as a further possible embodiment a dumbbell 1a, which differs from the dumbbell 1 essentially in that the weight disks 8a corresponding to the weight disks 8 are each provided with a central opening 20, and that the bar 5a corresponding to the bar 5 forms a journal 21 on both ends on the same axis as the longitudinal axis L and extending over nearly the entire axial length of the interior 6 of the respective casing 3 or 4, on which (journal) the individual weight disks 8a can be placed with their openings 20. For each weight disk 8 the journal 21 is provided with a ring-shaped groove 22. This is used to hold an edge area of the opening 20 of the respective weight disk 8a.

As depicted, the journal 21 has a maximum diameter that is smaller than the diameter of the opening 20. The weight disks 8a are likewise inserted with the cam 14 in the non-locking position. After insertion of the desired number of weight disks 8, the cam 14 is moved into the locking position, which causes this cam to bear against the edge of the weight disks 8 and to press them with the edge of their openings 20 radially into a groove 22, where they are fixed so that the weight disks 9a are anchored in the respective casing 3 or 4.

It is assumed above that the casings 3 and 4 are designed to be rotationally symmetrical, for example bell-shaped in relation to the longitudinal axis L of the dumbbell 1 or 1a. Figure 5 shows as a further possible embodiment a dumbbell 1b corresponding to the dumbbell 1a, in which the two casings 3 and 4, and also the weight disks 8b, are square in shape. Other shapes are also conceivable for the casings and the weight disks.

The invention was described above based on sample embodiments. It goes without saying that further modifications and adaptations are possible, without abandoning the underlying inventive idea on which the invention is based. For example, it is also possible to provide a rubber-elastic material on the respective surfaces instead of the recesses 18 and 22 or to manufacture the respective surfaces or the casing of a rubber-elastic material, so that the weight disks 8 press with their outside circumference into this material after swiveling the cam 14 into the locking position or can be pressed with the edge of their openings 20 into this material, thereby being held in place.

Generally it is also possible to design the electronic circuitry so that a standardized or individual training program created for the respective user and stored in memory of the electronic circuitry can be started for example via the button 11, after which the sequence is displayed to the user in the display 9 or via an acoustic transmitter of the electronic circuitry. Other applications for the electronic circuitry are also conceivable.

Furthermore, the electronic circuitry can also be part of a theft protection system, for example in cooperation with a sensor device located at an exit of a training center, which produces an acoustic and/or a visual alarm signal in the event that the dumbbell is stolen. Instead of electronic circuitry or an active electric component or also in addition to this, a passive element can be provided for in the dumbbell that works together with a stationary device for example at an exit of a training or fitness center, namely in the same manner as anti-theft devices in retail stores.

## Reference List

- 1, 1a, 1b      dumbbell
- 2      pipe or sleeve-like dumbbell element
- 3, 4      casing
- 5, 5a      bar
- 6      casing interior
- 7      plate
- 8, 8a, 8b      weight disk
- 9      electronic circuitry
- 9.1      display
- 10      thumb
- 11      button or sensor
- 12      contact
- 13      peripheral wall
- 14      cam
- 15      swivel axis of extender
- 16      lever
- 17      peripheral groove
- 18, 19      recess
- 20      opening
- 21      journal
- 22      groove

### **Abstract**

The invention relates to a new design for a dumbbell with a dumbbell handle element and at least one holder for removable fastening of one or more weight disks on one end of the dumbbell handle element.